

**REMARKS/ARGUMENTS**

Claims 23, 24, and 26-45 are pending. In the Office Action mailed July 9, 2007, claims 23, 30-34, and 36-41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Blumenau (U.S. Patent No. 6,421,711) in view of Otterness (U.S. Patent No. 6,792,472). Claims 24, 26, 27, 29, 35, and 42-44 were rejected under 35 U.S.C. § 103(a) as unpatentable over Blumenau and Otterness, and further in view of Mason (U.S. Patent No. 6,487,562). Lastly, claims 28 and 45 were rejected as unpatentable over Blumenau, Otterness, and Mason, and further in view of Chong (U.S. Patent No. 6,349,357). The independent claims (comprising claims 23, 29, and 30) have been amended to define over the cited references. No new matter has been added. Further examination and reconsideration of the application, as amended, are requested.

The claimed invention relates to a storage system in which an array of storage media comprising logical disks are connected over data paths via a network to I/O ports in accordance with data rate capability of the data paths, such that a data path is selected in response to a request for a desired quality of service with respect to a communication link over the network. The selected data path includes a logical disk and I/O port with sufficient data speed to satisfy the desired quality of service and thereby comprise a guaranteed quality of service data path, if such a guaranteed quality of service data path is available, and otherwise the selected data path includes a logical disk and I/O port that do not comprise a guaranteed quality of service data path but have available resources sufficient to satisfy the desired quality of service. All of the independent claims, comprising claims 23, 29, and 30 as amended, recite that the data path is selected in this way.

Applicants assert that the amended independent claims are patentable over the cited references because no combination of the cited references can provide the features of the amended claims.

The amended claims (taking claim 29 as an example) recite that a data path between logical disks and I/O ports across a network connection is selected in response to a request for a desired quality of service with respect to a communication link over the network

connection, "such that the selected data path includes a logical disk and I/O port with sufficient data speed to satisfy the desired quality of service and thereby comprise a guaranteed quality of service data path, if such a guaranteed quality of service data path is available, and otherwise the selected data path includes a logical disk and I/O port that not comprising a guaranteed quality of service data path while having available resources sufficient to satisfy the desired quality of service." The other independent claims (claim 23 and claim 30) include a similar feature.

Thus, the claimed system selects a data path having suitable resources to provide a guaranteed quality of service (QoS) capability in response to a request (see, for example, the specification at page 2, lines 13-25 and page 5, lines 14-19). If a data path can provide a guaranteed QoS capability, then that path is selected; otherwise, the path is selected from available resources that do not provide guaranteed QoS. For example, Figure 9 shows that a "Communications Port 1" 905 is comprised of a QoS communication link having 24 Mbps of communications data speed, as illustrated by numeral 907, whereas "Communications Port 2" 906 is comprised of a non-QoS communication link that has remaining resources of 36 Mbps of data speed, as indicated by numeral 910. Hence, the claimed system can select a data path between the storage system and an I/O port having a guaranteed QoS and, even if a guaranteed QoS data path is not available, a data path having a non-QoS link can be selected, having available resources sufficient to satisfy the desired quality of service, and thereby providing the requested QoS on a "best effort" basis. See Figure 3 and accompanying description at page 6, line 18 through page 7, line 31.

None of the cited references, alone or in combination, teaches or suggests the above-mentioned features. Blumenau describes a storage system, but does not describe selecting a network data path based on requested quality of service. Otterness relates to message routing among RAID controllers and was cited for using a routing table for path selection within the RAID system. Otterness also has nothing to do with selecting a network data path with logical disk and I/O port based on requested quality of service. Mason describes aspects of selecting RAID host adapters 15 within a storage system 10 in accordance with QoS parameters using a system data bus 18 (see Fig. 1), but has nothing to do with selecting logical disk-I/O port data paths across a network. Chong describes constructing a storage system controller so that system


processing units provide desired internal bandwidth. Chong also has nothing to do with selecting a network data path based on requested quality of service. The other references of record have been studied but likewise do not relate to the claimed invention. Therefore, because the amended claims include features that cannot be provided by the cited references, it is asserted that the amended claims are patentable over the art of record.

Thus, Applicants assert that the amended independent claims 23, 29, and 30 are in condition for allowance. Applicants also assert that the dependent claims rejected over the cited combinations comprising one or more of Blumenau, Otterness, Mason, and Chong (claims 24, 26-28, and 31-45) are likewise patentable, for at least the reasons described above. Moreover, these dependent claims contain additional limitations that are not provided by any combination of the cited references, and these claims also are patentable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Respectfully submitted,

  
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